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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/770,520	02/04/2004	Tomohiro Saito	05225.0259	1739

7590 01/21/2005

Finnegan, Henderson, Farabow,  
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Washington, DC 20005-3315

EXAMINER
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EVERHART, CARIDAD

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/770,520	<b>Applicant(s)</b> SAITO ET AL.	
	<b>Examiner</b> Caridad M. Everhart	<b>Art Unit</b> 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 December 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-5, 9, 12, 14, 16, 18, 20 and 22 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6-8, 10, 11, 13, 15, 17, 19 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

Applicant's arguments with respect to claims 1,2,6-8,10-11,13,15, and 17 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 103***

Claims 1,2,6-8,10-11,13,15, and 17<sup>19 and 21</sup> are rejected under 35 U.S.C. 103(a) as being unpatentable over Byun, et al. (US 5,744,398) in view of Komatsu (US 5,654,242) and further in view of Weiner(US 5,569,624).

Byun, et al disclose the steps of forming a gate dielectric, depositing a tungsten silicide layer, doping the silicide layer, heat treating the silicide layer, patterning the silicide to form a gate, and forming source and drain regions by implanting, using the gate as a mask(col. 1, lines 62-67; col. 2, lines 1-5 and 10-20; and col. 3,lines 18-24).

Byun, et al is silent with respect to the control of the work function and with respect to the use or irradiating for the heat treatment.

Komatsu discloses the control of the work function of a tungsten silicide gate in a CMOS device by implantation and heat treatment of the silicide gate(col. 1,lines 17-21; col. 11, lines 63-67; col. 12, lines 66-67; col. 13, lines 1-14 and 51-55).

Weiner teaches the equivalence of furnace heating with rapid thermal anneal in the heating of an implanted layer(col. 5, lines 65-67 and col. 6, lines 1-3). Weiner also teaches the use of laser anneal(col. 4, lines 45-53).

It would have been obvious to one of ordinary skill in the art at the time of the invention that the work function was controlled in the process taught by Byun, et al because Komatsu teaches that the implantation and heating steps control the work function of a tungsten silicide gate. It would have been obvious to one of ordinary skill

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in the art at the time of the invention to have used irradiation in the method taught by Byun, et al because Weiner teaches the equivalence of furnace heat treatment such as used by Byun, et al and irradiation such as rapid thermal treatment, which is irradiation using a lamp, which is an incoherent source or radiation. It would also have been obvious to one of ordinary skill in the art at the time of the invention to have used coherent radiation such as laser radiation as taught by Weiner in the process taught by Byun, et al because Weiner teaches that this method prevents the dopant from being driven into the substrate from the silicide(col. 4, lines 48-53).

***Allowable Subject Matter***

Claims 3-5,9,12,14,16, <sup>20, and 22</sup> ~~and 18~~ are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Everhart  
1-19-2005

*C. Everhart*  
CARLOND EVERHART  
PRIMARY EXAMINER